

WHAT IS CLAIMED IS:

1. A capacitive humidity sensor, comprising:

a semiconductor substrate;

a detection portion including:

5 a pair of detection electrodes disposed to oppose each other on the semiconductor substrate; and

 a moisture sensitive film disposed on the pair of detection electrodes, so that the moisture sensitive film changes a capacitance thereof according to humidity;

10 a reference portion including:

 a pair of reference electrodes disposed to oppose each other on the semiconductor substrate;

 a converting means for converting a difference between a capacitance of the pair of reference electrodes and a capacitance of the pair of detection electrodes to an electric signal; and

15 a capacitance adjusting film disposed on the pair of reference electrodes in order to reduce a difference between the capacitance of the pair of reference electrodes and the capacitance of the pair of detection electrodes in a reference humidity condition.

20 2. The capacitive humidity sensor according to claim 1, wherein:

 the detection electrodes and the reference electrodes are substantially equal in pattern and size; and

25 the moisture sensitive film and the capacitance adjusting film have substantially equal permittivity in the reference

humidity condition.

3. The capacitive humidity sensor according to claim 1,
wherein the capacitance adjusting film is a moisture permeation
5 film.

4. The capacitive humidity sensor according to claim 3,
wherein the moisture permeation film is provided not only in the
reference portion but also on the moisture sensitive film of the
10 detection portion.

5. The capacitive humidity sensor according to claim 3,
wherein the moisture permeation film is a gel film.

15 6. The capacitive humidity sensor according to claim 1,
wherein the capacitance adjusting film includes:

the moisture sensitive film extending to cover not only the
detection portion but also the reference portion; and

a moisture blocking film provided on the moisture sensitive
20 film in the reference portion.

7. The capacitive humidity sensor according to claim 6,
wherein the moisture blocking film is a silicon oxide film or a
silicon nitride film.

25 8. The capacitive humidity sensor according to claim 1,
wherein:

the pair of detection electrodes in the detection portion is comb-shaped; and

each tooth portion of one of the detection electrodes is interleaved between corresponding tooth portions of the other of the detection electrodes.

9. The capacitive humidity sensor according to claim 1, further comprising:

a first insulation film provided between the detection electrodes and the semiconductor substrate, and between the reference electrodes and the semiconductor substrate; and

a second insulation film provided between the detection electrodes and the moisture sensitive film, and between the reference electrodes and the capacitance adjusting film.

10. A capacitive humidity sensor, comprising:

a semiconductor substrate;

a first insulation film formed to cover a surface of the semiconductor substrate;

a pair of detection electrodes disposed to oppose each other on the first insulation film;

a pair of reference electrodes disposed to oppose each other on the first insulation film, the pair of reference electrodes being substantially equal to the pair of detection electrodes in pattern and size;

a converting means for converting a difference between a capacitance of the pair of detection electrodes and a capacitance

of the pair of reference electrodes to an electric signal;

a second insulation film formed to cover the pair of detection electrodes and the pair of reference electrodes;

a moisture sensitive film disposed on the second insulation film in a region where the pair of detection electrodes is disposed, so that the moisture sensitive film changes a capacitance thereof according to humidity; and

a moisture permeation film disposed on the second insulation film in a region where the pair of reference electrodes is disposed in order to reduce a difference between the capacitance of the pair of detection electrodes and the capacitance of the pair of reference electrodes in a reference humidity condition, the moisture permeation film having a permittivity substantially equal to a permittivity of the moisture sensitive film in the reference humidity condition.

11. A capacitive humidity sensor, comprising:

a semiconductor substrate;

a first insulation film formed to cover a surface of the semiconductor substrate;

a pair of detection electrodes disposed to oppose each other on the first insulation film;

a pair of reference electrodes disposed to oppose each other on the first insulation film, the pair of reference electrodes being substantially equal to the pair of detection electrodes in pattern and size;

a converting means for converting a difference between a

capacitance of the pair of detection electrodes and a capacitance of the pair of reference electrodes to an electric signal;

a second insulation film formed to cover the pair of detection electrodes and the pair of reference electrodes;

5 a moisture sensitive film disposed on the second insulation film in a region where the pair of detection electrodes is disposed, so that the moisture sensitive film changes a capacitance thereof according to humidity; and

10 a moisture permeation film disposed to cover the moisture sensitive film and the second insulation film in a region where the pair of reference electrodes is disposed in order to reduce a difference between the capacitance of the pair of detection electrodes and the capacitance of the pair of reference electrodes in a reference humidity condition, the moisture permeation film
15 having a permittivity substantially equal to a permittivity of the moisture sensitive film in the reference humidity condition.

12. A capacitive humidity sensor, comprising:

a semiconductor substrate;

20 a first insulation film formed to cover a surface of the semiconductor substrate;

a pair of detection electrodes disposed to oppose each other on the first insulation film;

25 a pair of reference electrodes disposed to oppose each other on the first insulation film, the pair of reference electrodes being substantially equal to the pair of detection electrodes in pattern and size;

a converting means for converting a difference between a capacitance of the pair of detection electrodes and a capacitance of the pair of reference electrodes to an electric signal;

a second insulation film formed to cover the pair of detection electrodes and the pair of reference electrodes;

a moisture sensitive film disposed on the second insulation film in a region where the pair of detection electrodes and the pair of reference electrodes are disposed, so that the moisture sensitive film changes a capacitance thereof according to humidity;

and

a moisture blocking film disposed on the moisture sensitive film in a region where the pair of reference electrodes is disposed in order to reduce a difference between the capacitance of the pair of detection electrodes and the capacitance of the pair of reference electrodes in a reference humidity condition, the moisture blocking film blocking moisture to the moisture sensitive film in a region where the pair of reference electrodes is disposed.